CLAIMS

1. A method for forming nanostructures of semi-conductor material on a substrate of dielectric material by chemical vapour deposition (CVD), characterised in that it comprises the following steps:

- a step of forming on the substrate (12) stable nuclei (14) of a first semi-conductor material in the form of islands, by CVD from a precursor (11) of the first semi-conductor material chosen so that the dielectric material (12) accepts the formation of said nuclei (14),

- a step of forming nanostructures (16A, 16B) of a second semi-conductor material from the stable nuclei (14) of the first semi-conductor material, by CVD from a precursor (21) chosen to generate a selective deposition of the second semi-conductor material only on said nuclei (14).

2. A method according to claim 1 in which the first and second semi-conductor materials are silicon.

3. A method according to claim 1 in which the first semi-conductor material is silicon and the second semi-conductor material is germanium.

4. A method according to claim 1 in which the substrate of dielectric material (12) is chosen in such a way that it is as reactive as possible with the precursor (11) of the first semi-conductor material.

5. A method according to claim 1 in which the substrate of dielectric material (12) is chosen from among the group comprising SiO_2, SiO_2 with a high density of Si–OH groups on its surface, Si_3N_4, Al_2O_3 and HfO_2.

6. A method according to claim 1 in which the step of forming stable nuclei (14) of a first semi-conductor material is carried out for an exposure time chosen as a function of the desired density of nuclei.

7. A method according to claim 1 in which the step of forming nanostructures (16A) of a second semi-conductor material is carried out for an exposure time chosen as a function of the desired size of nanostructures (16B).

8. A method according to claim 1 in which said steps are carried out with a low partial pressure of precursor (11, 21).

9. A method according to claim 2 in which the precursor (11) of the first semi-conductor material is silane.

10. A method according to claim 9 in which the formation of nuclei (14) of the first semi-conductor material is carried out at a temperature between 550 °C and 700 °C and with a low partial pressure of silane, less than around 133 Pa (1 Torr).

11. A method according to claim 9 in which the step of forming stable nuclei (14) of a first semi-conductor material being carried out at partial pressures less than around 1.33 Pa (10 mTorr), the exposure time of the substrate to the precursor (11) of the first semi-conductor material is less than 15 minutes.

12. A method according to claim 9 in which the step of forming stable nuclei (14) of the first semi-conductor material being carried out at partial pressures less than around 133 Pa (1 Torr), the exposure time of the substrate to the precursor (11) of the first semi-conductor material is less than 1 minute.

13. A method according to claim 2 in which the precursor (21) of the second semi-conductor material is dichlorosilane.

14. A method according to claim 3 in which the precursor (21) of the second semi-conductor material is germane.

15. A method according to claim 13 in which the step of forming nanostructures (16A) is carried out at a temperature between 300 °C and 1000 °C and with a partial pressure of precursor (21) less than around 133 Pa (1 Torr).

16. Nanostructures formed by the method according to claim 1 characterised in that the nanostructures are of homogeneous and controlled size.

17. Nanostructures according to claim 16 characterised in that they are doped by co-deposition or by implantation with elements such as boron, phosphorous, arsenic or erbium.

18. Nanostructures formed according to claim 16 characterised in that they are encapsulated by deposition of a dielectric.

19. A storage cell having a floating gate characterised in that said floating gate is formed of nanostructures according to claim 18.

20. A storage cell according to claim 20 characterised in that it is a DOTFET.